ALARM ANNUNCIATORS

Monitors potential free input contacts (NO or NC) 4 to 16, for any change of status (Abnormal) & activates one common output relay for audible device with respective flashing LED windows, thus indicating the "Alarm" status. This flashing annunciation window is "Acknowledged" & "Reset" (when returns back to normal) by external push buttons.

- Powerful Microprocessor Circuit.
- Optically Isolated input Circuit.
- Low Power Consumption.
- Two Window Sizes, Big & Small.
- Built-in system watchdog LED.
- Super Bright LEDs.
- Fully integrated construction.
- NO/NC selectable input configuration.
- AC/DC auxiliary supply.
- DIN standard panel cutouts.
- Front replaceable windows & Inscriptions.
- Moulded enclosures.

12B2SPO 10B4SPO

10B6SPO 26B0SPO

10B8S00 20B16S00

14B0S00 416B0S00

28B0S00 312B0S00

	With Pushbuttons	Cutout Size	Small Window no Pushbuttons	Cutout Size	Large Window no Pushbuttons	Cutout Size
4 Points	**12B2SPO-***	68x138	–		**14B0S00-***	68x138
5 Points	**10B4SPO-***	68x138	–		–	
6 Points	**10B6SPO-***	68x138	–		–	
6 Points	**26B0SPO-***	138x138	–		–	
8 Points	–		**10B8S00-***	68x138	**28B0S00-***	138x138
12 Points	–		–		**312B0S00-***	210x138
14 Points	**20B14SPO-***	138x138	–		–	
16 Points	–		**20B16S00-***	138x138	**416B0S00-***	282x138
22 Points	**30B22SPO-***	210x138	–		–	
24 Points	–		**30B24S00-***	210x138	†**624B0S00-***	2x(210x138)

*Add supply Voltage: **A**: 230VAC, **B**: 24VDC

†Supplied with separate power supply

Specifications

Aux. Supply:	24/48V DC / 110/220V AC	LED:	Colour Red (Amber/Green on request)
Input:	Potential Free Contacts (NO or NC Site Configurable)	Interrogation Voltage:	12V DC
Output:	1 NO for Audible Hooter	Response Time:	25m.sec. ±10m.sec
Rating:	5A, 230V AC Resistive	Power Consumption:	1.5W/Window
Facia Window Size:	Big: 60 x 30mm Small: 30 x 30mm	Grouping (Trip/Non Trip):	Optional
Flash Rate:	Fast: 60 Flash/Min. Slow: 30 Flash/Min.		

Printing of Front Replaceable Windows

Code	Description
AL-30	30 x 30mm transparent film
AL-60	60 x 30mm transparent film

- Black letters on transparent film to be sandwiched between front & rear difusers

Accessories

Code	Description	Code	Description
AL-3030-R	Red Perspex window 30x30mm c/w LED Block	**AL-6030-R**	Red Perspex window 60x30mm c/w LED Block
AL-3030-Y	Yellow Perspex window 30x30mm c/w LED Block	**AL-6030-Y**	Yellow Perspex window 60x30mm c/w LED Block
AL-3030-G	Green Perspex window 30x30mm c/w LED Block	**AL-6030-G**	Green Perspex window 60x30mm c/w LED Block

SELCO

M4100

M1000

8 & 10 Channel Alarm Annunciator

- Input contact type NO/NC and delays 0-15 secs are selectable individually on all channels.
- Two common output relays for siren and alarm with voltage free contacts.
- Legend can be typewritten on the label easily accessible behind front plate.
- Two integrated push buttons for siren reset/lamp test and alarm accept.
- Remote individual selectable blocking with adjustable unblocking delay 0-15 secs.
- Plug-in terminal block for easy service.
- DC or AC supply voltage.

Specifications for M4100

- Consumption: 0.15A
- Temp Range: -20˚ to +70˚C
- Minimum input delay: 50ms

Specifications for M1000

- Output relay :Max. 220V AC/2A
- Output :Max. 150mA per channel
- LED flash frequency :Slow Flashing Light 0.8Hz ±10%
  Quick Flashing Light 8Hz ±10%
- Programming :Switches on rear of unit
- Reset/Lamp Test :Via Pushbuttons
- Power Consumption :180mA

Description	Supply	Size	Code
8-Channel Annunciator	12VDC/AC ±30%	96x96	**M4100-12**
8-Channel Annunciator	24VDC/AC ±30%	96x96	**M4100-22**
10-Channel Annunciator	12-24VDC	144x144	**M1000-24-00C**

Accessories for M4100

Front cover with handle IP54 **M0846-00** Front cover with key IP54 **M0846-01**

MICRO PLCs

M90 extended family of PLCs extends to 158 I/0, GSM and MODbus communication, with embedded graphic operator panel. PLC & HMI programmed with one programme! All models supplied with software, instruction manual, cable & connectors.

M90-R1	M90-R1-CAN	M90-R2-CAN	M90-T1	M90-TA2-CAN	V120-12-R1	V120-12-R2C	V120-12-UN2	V230-13-B21	V260-16-B21	IP65 when panel mounted
										Display
1 line x 16 characters					8 lines x 22 characters 128 x 64p			128 x 64p	240 x 64p	Resolution (Pixels)
80					255			100		HMI display
										Keyboard
15					16			24	33	No. of keys
										Programme
2048 words					16k words			16k words		PLC size
Real-time clock functions (date and time) with 7 year battery backup – all models										Real time clock
256					1024			2048		Coils
256					1024			1600		Registers/integers
–					256			256		32 bit integers
64					128 (32 bit)			192		Timers
–					64 (32 bit unsigned)			64 (32 bit unsigned)		Double word
12µsec					0.8µsec			0.8µsec		Execution time
										Communication
1 port					2 ports			2 ports		RS232
RS232/485 converter supplied					1 port			1 port		RS485
–	1 port	1 port	–		–	1 port	–	1 port		CANbus
–					Master/slave protocol			Master/slave protocol		MODBUS
Up to 6 phone numbers, up to 1k of user defined messages					Up to 8 phone numbers			Up to 8 phone numbers		GSM
										I/Os
8 PNP			10 PNP		7 PNP/NPN		8 PNP/NPN	16 PNP/NPN		Digital inputs
2 (16 bit)					3 (32 bit)		2 (32 bit)	2 (32 bit)		High speed input
1[2]	2[4]	–	2[5]		1[2]	2[2]	(2 below)	3[3]		Analog input
–					2[6]			–		Thermocouple/PT100
6			–		6		–	10		Relay outputs
–		11	8		–		10	4 PNP/NPN		pnp outputs
–			1 (0-10V)		–			–		Analog outputs
–		1 (1.5kHz)	–		–		2 (2kHz)	2 (50kHz) NPN		Highspeed output
Up to 64 extra I/O via 8 expanders					Up to 128 I/O extra via 8 expanders					I/O expansion
										General
24VDC					12/24VDC			12/24VDC		Power supply
96 x 96					96 x 96			218 x 184	260 x 184	Size mm

Notes: 1) High speed counter/shaft encoder/frequency measurer of normal digital inputs, 10kHz max. Can be used as normal digital input. 2)10 bit analog input: 0-5V, 0-10V, 0-20mA, 4-20mA. 3) 10 bit analog input: 0-10V, 0-1mA, 4-20mA,4-20mA. 4) 10 bit analog input: 0-5V, 0-10V. 5) 10 bit analog input: 0-10V. 6) 14 bit universal input for thermocouple, PT100, 0-10V, 0-20mA, 4-20mA.

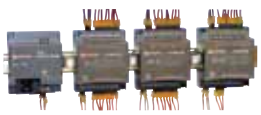
Communication Options

- RS232/485 Up to 64 mixed M90 family units
- CANbus
- MODBUS
- GSM/SMS control
- Remote access with any phone-line modem

VisiLogic Ladder Software

One Windows-based program for both PLC & HMI

Expansion Modules



***Note:** when using expansion modules expansion adaptor must be installed*

EX-A1	Expansion Adaptor
IO-DI8-TO8	8 Digital Inputs, 8 Transistor Outputs
IO-AI4-AO2	4 Analog Inputs, 2 Analog Outputs
IO-DI8-RO4	8 Digital Inputs, 4 Relay Outputs
IO-DI16	16 Digital Inputs
IO-TO16	16 Transistor Outputs
IO-RO8	8 Relay Outputs
EX90-DI18-RO8	8 Digital Inputs, 8 Relay Outputs
IO-PT4	4 PT100 Inputs, -42 to 112°C

Accessories

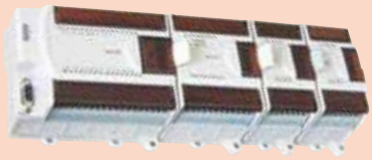
OPLC-GSM-K1	GSM modem, magnet antenna, cables and adaptors
M90-19-R4	RS232 to RS422/485 converter
V200-19-ET1	Ethernet module for PLC V230 & V260 only

For power supplies, see page 69.

LM MICRO SERIES PLCs

The Lm Micro Series PLC is comprised of various modules. The basic functional configuration requires a CPU module working as a basic unit, in complement with optional expansion modules such as communication modules, digital I/0 modules and analogue I/0 modules

NEW RANGE



LM3104	LM3105	LM3106	LM3107E	LM3109	LM3230-EDMT	LM3231-EDMR	LM3330-EAM	HT6600C	HT6800T	
CPU Modules					**Expansion Modules**			**HMI Display**		**General**
24VDC	240VAC	24VDC	240VAC	240VAC				21-28VDC		Power Supply
125(L) x 90(W) x 70(H)mm					50(L) x 90(W) x 70(H)mm			192 x 138mm	224 x 161mm	Size
										Programme
Unlimited number of counters, 15 bits counting range							12 bit A/D	320 x 240	640 x 480	Resolution
Unlimited number of timers, 1ms to 49days					10 000 000 Open/ Close			10 000hrs		Timers/ Lifespan
0.37μs per instruction					<10ms	<10ms	<10ms	200mHz RISC		Excecution time
Real time clock function, 10 years back-up										Real Time Clock
60 000 words							65 535 words	128k Words		PLC Program Size
								Communication		
1	1	1	1	1	–	–	–	RS232		
–	–	–	–	1	–	–	–	RS485		
Yes	Yes	Yes	Yes	Yes	–	–	–	Modbus		
Yes	Yes	Yes	Yes	Yes	–	–	–	G-Mode		
								I/Os		
5	5	11	9	21	4	4	–	Digital Inputs		
3	3	3	3	3	–	–	–	Digital High Speed Inputs		
–	–	–	2	–	–	–	4	Analog Input		
–	6	–	8	16	–	4	–	Relay Outputs		
6	–	10	–	1	4	–	–	PNP Outputs		
–	–	–	1	–	–	–	–	Analog Output		
1 Point, 20kHz	–	2 Points, 20kHz	–	–	–	–	–	Pulse Output		
2	2	4	4	7	–	–	–	Max Expansion Module		

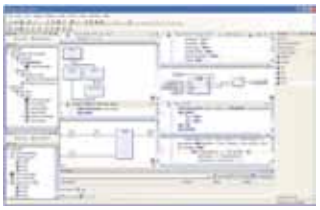
Connections

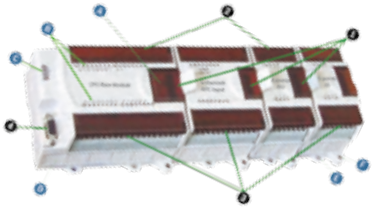
1. Connection to expansion modules
2. Wiring terminal for output + input power supply
3. Wiring terminal for input + output power supply
4. RS-232/RS-485 communication port

A. RUN/STOP operation switch + analogue presets
B. I/O channels status indicator
C. PLC status indicator - Run, Stop, Com, Error
D. Heat radiator
E. DIN Rail fastener
F. Hole for backplane or wall mounting

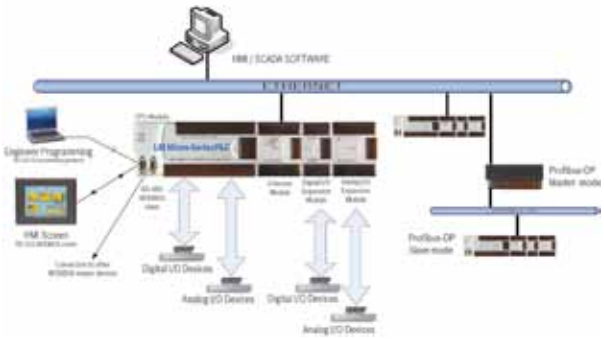
Programming Languages

- Instruction List (IL)
- Sequence Function Chart (SFC)
- Ladder Diagram (LD)
- Function Block Diagram (FBD)
- Structual Text (ST)
- Continuous Function Chart (CFC)





Communication Options



Catalogues & Manuals

LD3000	LM Micro Series PLC - Hardware Manual
LD3001	LM Micro Series PLC - Software Manual
LD3002	LM Micro Series PLC - Instruction Manual
HT6101	HMI User Guide
LM3101	Complete software & info
HMI101	Complete software & info

Expansion Modules

Code	Description
LM3210-EDI	8 Digital 24VDC input module
LM3211-EDIA	8 Digital 230VAC input module
LM3220-EDOT	8 Digital 24VDC solid state output module
LM3222-EDOR	8 Digital 230VAC /24VDC relay output module
LM3221-EDOT	16 Digital 24VDC solid state output module
LM3223-EDOR	16 Digital 230VAC/24VDC relay output module
LM3310-EAI	4 Channel Analog input module
LM3320-EAO	4 Channel Analog output module
LM3401	Profibus DP slave interface module
LM3403	Ethernet interface module

Accessories

LS3601	LM PLC & HMI Programming Software CD
LA3801-COM-300	LM Communication Cable - RS-232 Cable (2m)
LA3810	LM Expansion Module (500mm length)
HT6100	HMI USB Programming cable
HD2100	RS-232 Serial programming cable

kWh METERS

HX12D-40/60

HX34

Rotating Disc kWh Meters 0142 Authorisation No. 0102402

1-Phase 230V	Range
HX12D-40	10-40A
HX12D-60	15-60A
HX12D-80	20-80A

Size (mm): 160H x 122W x 126D

3-Phase 380V+N	Range
HX34D-80	20-80A
HX34D-100	30-100A
HX34C	CT-5A

Size (mm): 260H x 170W x 135D

6 Digit register
Metal Base and Polycarbonate cover
Lower bearing is magnetic suspension type

Mechanical Counter kWh Meters

NEW

DDS223-30 DDS223-63 DDS722-100 DTS722-60/100

1-Phase 230V	Range	Size	Pulse/kW
DDS223-30	5-30A	1m	2000
DDS223-63	5-63A	2m	2000
DDS722-100	5-100A	3m	800

3-Phase 400V+N	Range	Size	Pulse/kW
DTS722-60	5-60A	6m	320
DTS722-100	5-100A	6m	160

1m=17.5mm Wide
• Pulsed output 3200 Imp/kWh • Class 1

Digital kWh Meters

NEW NEW

DDSF223-30 DDSF223-63 DDSF722-60 DSS722-5/ 60/ 100

1-Phase 230V	Range	Size	Pulse/kW
DDSF223-30	5-30A	1m	2000
DDSF223-63	5-63A	2m	2000
DDSF722-60	5-60A	3m	1600

3-Phase 400V + N	Range	Size	Pulse/kW
DSS722-5	1.5-5A (CT)	6m	1600
DSS722-60	5-60A	6m	320
DSS722-100	5-100A	6m	160

PRE-PAYMENT kWh METERS

Pre-payment kWh Meters

Code	Description	Amps	Output Pulses/kW
DDSY238-60	Single Phase	15-60A	1600
DTSY238-60	3-Phase 4 wire 400V+N	15-60A	200
DTSY238-80	3-Phase meter. 4wire 400V+N	20-80A	100

• Power failure memory
• Direction of power indication
• Anti-theft function
• Coded card for fraud protection
• Software requires Windows XP© or Windows 7©

Accessories

Code	Description
DDSY-C	Pre-payment Card
DDSY-P	Card readers. c/w program software

DDSY-C

DDSY-P

POWER FACTOR METER

NEW

Digital Power Factor Meter

Code	Size	Operating Voltage	Accuracy	CT-Ratio	Range	Display
ECR-3-72	72 x 72	230VAC ±10%	1% ±1 digit	.../5A	0.00-0.99	4-digit 14.2mm high
ECR-3-96	96 x 96	230VAC ±10%	1% ±1 digit	.../5A	0.00-0.99	4-digit 14.2mm high

Non-flammable enclosure
Flush mounting with rear terminals

MODULAR ENERGY METER (kWh)

- DIN Rail Mount
- Operating Temp: -20 to 50°C

c/w tamper-proof terminal seal

c/w 80A CT

Code	ES-32L	ES-80L	CONTAX 2511	CONTAX 3221	CONTAX 6521
Supply Voltage Un	230VAC	230VAC	230VAC	230VAC	230VAC
Current, (I max)	5 (32)A	40 (80)A	5(25)A	5(32)A	10(63)A
Operating Current	0.02-32A	0.08-80A	0.02 to 25A	0.02 to 32A	0.04 to 65A
Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Operating Voltage	230VAC	230VAC	195 to 253V	195 to 253V	195 to 253V
Power Consumption	<2VA	<2VA	0.5VA	0.5VA	0.5VA
Precision accuracy class	Class1	Class1	Class 1	Class 1	Class 1
Pulse transmission	1000Imp/ kwh	1000Imp/ kwh	Type SO	Type SO	Type SO
Recorded harmonics	–	–	Until 7kHz	Until 7kHz	Until 7kHz
Size: 1M = (17.5mm)	1m	1m	1m	2m	2m
Digits	6+1	6+1	5+1	5+1	5+1

kWh METERS

Code		1 x kWh **1C15WP**	2 x kWh **1C15WP2**	**1C15WRP**
W, Wh or VA, Vah or VAR, VARh or PF	**ELF3234**	3 Phase 400V + N kWh Meter C/T Ratio selectable by DIP Switch **Selectable Primary CT Current:** 5, 10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100, 120, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1250, 1500, 1600, 2000, 2500, 3000, 4000, 5000, 6000 • 7 Digit Electro-mechanical display • Accuracy: 2% • Pulsed Output		**kWh and kVARh** 3 Phase 400V + N Indication (Active and Reactive Power) • 7 Digit Electro-mechanical display • Accuracy: 2% (kWh) 3% (kVARh)
W, Wh, PF or VA, Vah,PF or VAR, VARh, PF	**ELF3234-3**			
V, A, F	**ELF3259**			

- Inputs (V), 110 or 400VAC
  Range: 80-500V
  3 Phase 4 Wire
- Input (I) 1A or 5A programmable
- Supply Volts: 80-270VAC @ 3VA
  Accuracy: 2% for VARh
  All others: 1%
- Phase wise & total RMS for power, total for Energy Meters
- 10 year back-up of integrated data
- VA function selectable 3D or Arithmetic
- V shows all Line-Line, Line-Neutral, Individual & Average Voltages
- Size: 96 x 48 x 40(D)mm

kWh Indicator

NEW

PM-KW1

0-99kW Indicator
- c/w 16A Plug & Socket
- Ideal to check your kW usage from generator etc.

Digital Power kWh Meter

Code	RIMD.W15
Supply Voltage Un	230VAC
Current, (I max)	CT…/5A
Operating Current	60, 100, 150, 250, 400, 600, 1000/5A
Frequency	50/60Hz
Operating Voltage	195 to 253V
Power Consumption	4VA
Size: 1M = (17.5mm)	2m
Digits	3

kWh METERS

NEW

ZAP1CS
ZAP1CS-R

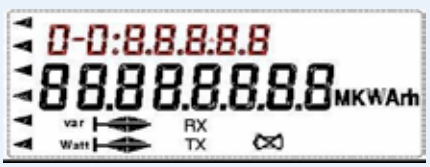
ZAP03DS

ZAP03BS / ZAP03BE-MD / ZAP03LM

NEW

ZAP3AM

ZAP-OPTO



*Note: All 3-phase meters must be programmed before use

Zaptronix kWh Meters

Features:

- Billing meter for active (kWh) import & export energy
- Low cost, no maintenance required
- Easy Meter Communication via Infrared flag port
- Engineering software included/ available for download at no charge
- 3 Phase , CT and VT connected Meter
- Large , Multi function LC -Display

Code	Type	Mounting	System	V Range	Amps	Accuracy
Single Phase High Load (100A) Direct Connect, Class 1 Accuracy Billing Meter						
ZAP1CS	BS	DIN Rail	1ph, 2-wire, 230V	184-275V	100A	10-100, Class 1
ZAP1CS-R	BS	Din Rail	1ph, 2-wire, 230V with RS485 Serial Port	184-275V	100A	10-100, Class 1
• Remote automated meter reading ready (**ZAP1CS-R**)						
Three Phase Active Energy Meter (CT-Connected)						
ZAP03DS*	DIN	DIN Rail	3Ph, 4 wire, 230/400	184-275V (L-N)	5A	1-5/6, Class 1
ZAP03BS*	BS	Base Mount	3Ph, 4 wire, 230/400	184-275V (L-N)	5A	1-5/6, Class 1
*Add **110V** for 3 phase system 3PH, 3 Wire, 88-132V (P-P)						
kWh Meter + Maximum Demand						
ZAP03BE-MD*	BS	Base Mount	3ph, 4-wire, 230/400V	184-275V (L-N)	5A	1-5/6, Class 1
*Add **110V** for 3 phase system 3PH, 3 Wire, 88-132V (P-P)						

Features:
Measurement parameters
- Watt, VAr, VA (Import/Export & per phase)
- Volt, Amp, Power Factor, Frequency

Energy & Maximum Demand
- kWh, kVAh, kVArh
- kW and kVA
- Block & Moving window

ZAP03BE-MD only
- Data & Event logging
- RS232
- Pulse output
- Time of use

kWh Meter + Maximum Demand + Load Management (Load Shedding)

ZAP03LM	BS	Base Mount	3ph, 4-wire, 230/400V	(L-N)	5A	1-5/6, Class 1

Features:
As per **ZAP03BE-MD** plus: I/O; 2 x I/P MD synch, E01, water or gas pulse (programmable);
4 x O/P load shedding, rated for 20mA @ 30VDC.

Additional Registers:
- Target demand
- Percentage Hysteresis
- Interlock timer
- Override
- Load priority setting
- Load switching frequency

NEW **PI-Range Profiling - Energy Demand Logging Multi-tariff Meter** - IEC 62053-21

ZAP3AM5/P	–	Base Mount	3Ph, 4 wire, 230/400	230V/400V	5A	1-5/6, Class 1
ZAP3AM100	–	Base Mount	3Ph, 4 wire, 230/400	230V/400V	100A	10-100, Class 1
ZAP3AM160	–	Base Mount	3Ph, 4 wire, 230/400	230V/400V	160A	10-160, Class 1

Features:
- Billing meter for active (Wh) and reactive (VArh) energy demand (VA)
- Flexible multi-tariff (TOU) billing meter with auto registration
- Profile logging of total energy and average energy demand
- Remote automated meter reading ready with **ZAP-EDAT**

NEW **Lambda-Range Logging - Energy Demand Logging Multi-tariff Meter** - IEC 62053-21

ZAP3AM5 230V	–	Base Mount	3Ph, 4 wire, 230/400	230V/400V	5A	1-5/6, Class 1
ZAP3AM5 110V	–	Base Mount	3Ph, 3 wire, 110V (P-P)	110V-480V	5A	1-5/6, Class 1

Features:
- 4 Quadrant, billing meter for active (Wh) and reactive (VArh) energy demand (VA)
- Data storage of last 16 months energy and maximum demand for 4 tariffs
- Load profile with integration period 1, 5, 30, 60min
- Event registration of power outages, per phase voltage loss, under/ over voltage
- Full multi-tariff (TOU) billing meter with auto registration
- Extensive 6 channel logging from 32 readings and event recording
- Remote automated meter data acquisition via IP or GSM-GPRS/SMS

Accessories

ZAP-EDAT	• EDAT+g for GSM-GPRS AMR at multi meter (up to 128) Installations **ZAP3AM, ZAPICS, ZAP03LM** • EDAT+e for Internet AMR at multi meter (up to 128) installations **ZAP1CS, ZAP3AM**
ZAP-SOFT	Remlt! Lite Programming Software CD. – download for free. Can be downloaded from *www.zaptronix.co.za/downloads*, This is for **ZAP03DS , ZAP03BE, ZAP03BS**
ZAP-OPTO	Optocoupler RS232 for BS type housing
ZAP-OPTO/USB	Optocoupler USB for BS type housing
***ZAP-PRO**	Factory programming for **ZAP** kWh meters (free service)
ZAP-MPS	(MPS) Meter reading & configuration software. Free download from www.zaptronix.co.za This is for **ZAP03AM, ZAP1CS**

ENERGY SAVING CONTROLLER

NEW

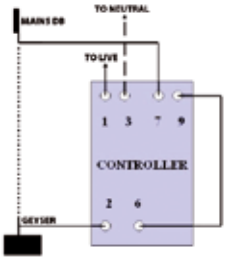
Geyser Controller with Embedded Microprocessor

Geysers are the largest user of electricity in most households using up to 60%. GC-100 geyser controller will save 40%-60% of geyser usage.

Code	GC-100
Features	• Immediate saving from first monthly bill. • Ensures geyser is off during peak periods • Back-up battery to retain memory • Override switch geyser off and on • 8 Pre-programmable time periods

Technical Info

- Input Voltage: 220/ 240VAC 50Hz
- Mounting: Din Rail
- Memory: 120 day battery
- Current Sensor: 20Amps
- Relay output 20A



NEW

MS15

ES100

ES300

Passive Power Factor Correction

Power Factor Correction (PFC) is a technique of counteracting the undesirable effects of electric loads that create a power factor less than one. This range of passive (PFC) units can save 10%-20% of energy consumpion.

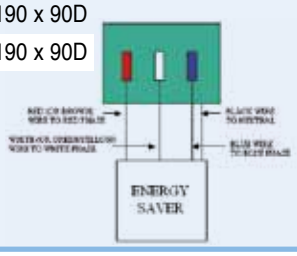
Code	Description	Dimensions
ES15	Single-Phase (1000kwh) 16A SA plug-in type	95 x 56 x 56
ES100	Single Phase (2000kwh)	125 x 85 x 60
ES300	Three-Phase (6200Kwh)	190 x 140 x 70D
ES3001	Three-Phase (10 000Kwh)	240 x 190 x 90D
ES3002	Three-Phase (15 000Kwh)	240 x 190 x 90D

Features

Prolongs life of appliances
Stabilise electrical current
Available in single and three-phase
Suitable for home, shops, offices, restaurants, etc.

Technical Info

Single-Phase voltage: 220-240VAC 50Hz
Three-Phase voltage: 380-420VAC
Operating temperature: 60˚C (max.)



The three-phase energy saver can be wired either at the DB or the incoming Eskom box.
Note: As long as the black is connected to neutral, it does not matter which of the other wires connect to which phase.

NEW

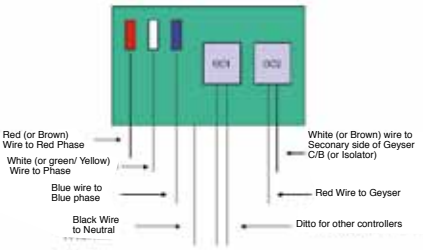
Combination Geyser/ Power Factor Protection & Surge Protection

Combination units consist of both geyser controller and passive power factor (energy saving). These are parallel connection types, for single and three phase units, some available fitted with surge protection.

Code	Description	Dimensions
ES100-GC	Single phase power + Geyser controller	170 x 200 x 85mm
ES100-GC-SS	Single phase power + Geyser + Surge protection	170 x 200 x 85mm
ES100-2GC-SS	Single phase power + 2 x Geyser + Surge protection	170 x 200 x 85mm
ES300-GC	Three phase power + Geyser controller	210 x 215 x 100mm
ES300-GC-SS	Three phase power + Geyser + Surge protection (3ph+N)	210 x 215 x 100mm
ES300-2GC-SS	Three phase power + 2 x Geyser + Surge protection (3ph+N)	210 x 215 x 100mm

Technical Info

Single-Phase voltage: 220-240VAC 50Hz
Three-Phase voltage: 380-420VAC
Surge Protection: 65kA


Red (or Brown) Wire to Red Phase
White (or green/ Yellow) Wire to Phase
Blue wire to Blue phase
Black Wire to Neutral
White (or Brown) wire to Secondary side of Geyser C/B (or Isolator)
Red Wire to Geyser
Ditto for other controllers

WIRELESS POWER DISPLAY UNIT

Monitor your own electricity and save power and money!

NEW

With the standard electricity In-Home-Display unit, you can clip the current sensor around the electricity meter's live feed supply such that it measures the total electrical power entering your home or office. Power consumption will be recorded and transmitted to the display unit wirelessly.
The following features are provided also:

- Dual battery system is used to extend operation period and to prevent data lost during battery changing
- Indicate existing cost alert level by Tri-color LED
- Display temperature and current time
- Clock alarm and cost alert level setting
- Monitor up to 8 sensors
- Support >30m RF transmission

This product is a semi-portable communication product used in the household market. You can view the instant electricity consumption, cost-up-to-current-hour and records (eg. hourly, daily, weekly, and monthly) as well as estimated CO_2 emission produced. Transmitting frequency 433mHz with proprietary communication coding for different market segments.

(1-Phase) Monitoring System

Code	Kit Description	
AML-1208	• 1 x Current sensor • 1 x Sender unit • 1 x Display unit	• 4 x Batteries • 1 x User Manual • 1 x Desk Stand

(3 Phase) Monitoring System
*Add 2 x Current Sensor **(AML-CS)** + **AML-1208**

Code	Description
AML-CS	Current Sensor

GENSET CONTROLLERS

Code	DSE501K-1	704	4120	NEW DSE720	NEW DSE7320
Application	Manual Start/Stop	AMF	AMF	AMF	AMF
Relay outputs	Fuel and Start solenoid Common Alarm Low oil Pressure	Fuel on, Crank 2 x Configurable	Fuel, Crank, Mains & Alt Contactor 2 x Configurable	Fuel, Crank, Mains & Alt Contactor 2 x Configurable	Standard Gen Controller Outputs + 4 x fully Configurable
Digital inputs	High Engine Temp. Auxiliary Shutdown Charge Fail	Low oil Pressure High Engine Temp. Auxiliary Shutdown +2 Configurable	Low oil Pressure High Engine Temp. Auxiliary Shutdown +2 Configurable	Low Oil Pressure, High Engine Temp, Emergency Stop, Remote Start (3 attempt) or Mains Stimulation, Charge Fail (D+) 2 Configurable	Standard Gen Controller Inputs + 8 fully Configurable
Analog inputs	None	None	None	2 Inputs. Coolant temp. & oil pressure with the option of configuring these as digital inputs	4 including pressure, temperature and fuel volume
Config. Method	None	Via front face	Via front face	Front face or PC via interface type P810	Limited front face, Fully via USB programming port
Event logging	None	None	None	None	250 most recent events
*Comms. Port RS232 or RS485	None	None	None	None	Type of events recorded can be selected. Fitted with both RS232 and RS485, but only one can be used at a time
Operator Display	First Up Fault *Low oil Pressure *High Engine Temp. *Charge fail warning *Auxiliary shutdown	Warning/Shutdown & active inputs are signalled by LEDs, load transfer (contactor control) have a mimic LED display	Hour counter + warning/ shutdown & active inputs are signalled by LED's Load transfer, (contactor control) have a mimic LED display	Backlit LCD scrolling Mains - Alternator voltage. Load Current, Oil Pressure, Engine Temperature, DC Volts, Hours Run, RPM and Hz, Alternator or Mains info, Common Alarm and Scroll Button. Mimic LEDs, Mode Selection	Multi Menu Access via front panel: Status, Engine, Generator, Mains, Alarms, Event log, Serial Port
Other Feautres					• Modbus RTU • IP65 gasket • USB connectivity & SCADA • Engine exercise Schedular • Dummy load control plus load shedding up to 5 stages
Panel Cutout	68 x 68	149 x 109	154 x 98	182 x 137	220 x 160
CANbus	None	None	None	None	CANbus

All controllers are suitable for 12 or 24V DC systems.
*For remote real time diagnostics and telemetry, including SMS communications. PSTN or GSM modem not included.

Code **P810** INTERFACE

USB Interface Module c/w cables and software for programming Model 720

Autonics ROTARY ENCODER

Coupling

Code E4DC-6/6
Code E5DC-8/8
Code E5DC-10/10

40mmØ, Shaft type encoder
(Incremental Type)

Type	Code	Supply Volts
Totem Pole Output (HTL)	**E40S6-*-3-1**	12-24VDC
NPN N/O Output (TTL)	**E40S6-*-3-2**	12-24VDC
Line Driver Output (TTL)	**E40S6-*-6-L**	5VDC
Pulses/Revolution	*Add to code: ***100, 360, 500, 1000,1024**	

NEW

50mmØ, Shaft type encoder
(Incremental Type)

Code	Supply Volts
E50S8-*-3-1	12-24VDC
E50S8-*-3-2	12-24VDC
E50S8-*-6-L	5VDC
*Add to code: ***50, 100, 200, 250, 360, 1000, 1024, 1800, 2500, 3600**	

Specifications

Shaft	6mm	8mm
Totem Pole Output	Low ☞ Load current: Max. 30mA, Residual voltage: Max. 0.4V High ☞ Load current: Max. 10mA, Output Voltage: Min. 1.5V	
NPN Open Output	Load Voltage: Max. 30V, Load current: Max. 30mA, Residual Voltage: Max. 0.4V	
Line Driver Output	Low ☞ Load current: Max. 20mA, Residual Voltage: Max. 0.5V High ☞ Load current: Max. -20mA, Output Voltage: Min. 2.5V	
Max. Response Freq.	180kHz	

NEW RANGE

GENSET CONTROLLERS 8-32 VDC

EAOM-19

EAOM-9

EAOM-9F

EAOM-210FLS

EAOM-2FDS

MESSENGER with GSM

Model	EAOM-19	EAOM-09	EAOM-09F	EAOM -210FLS	EAOM-210FDS	MESSENGER
Size (mm)	72 x 72	96 x 96	144 x 204 x 37	144 x 204 x 37	144 x 204 x 37	144 x 204 x 37
Automatic engine start/stop and load transfer	Y	Y	Y	Y	Y	Y
Manual, Automatic and Test Mode control	Y	Y	Y	Y	Y	Y
User configurable inputs	2	2	2	6	6	6
User configurable outputs	N	1	1	4	4	4
Optional expansion board with user configurable 8 I/O **EXOM-210.FL.EXR**	N	N	N	Y	N	N
Speed sensing from alternator voltage	Y	Y	Y	Y	Y	Y
Speed sensing from magnetic pickup	N	Y	Y	Y	Y	Y
3 resistive sender inputs (oil, fuel, temp.)	N	N	N	Y	Y	Y
Load current measurement	N	N	N	Y	Y	Y
Generator Volts measurement	L1/N	L1/N	L1/N	L-L-N	L-L-N	L-L-N
Mains Volts measurement	L-L-N	L-L-N	L-L-N	L-L-N	L-L-N	L-L-N
Earth current measurement	N	N	N	Y	Y	Y
Exercise at programmed time intervals	N	N	N	Y	Y	Y
RS-232, Modbus ASCII Serial communication	N	Y	Y	Y	Y	Y
Available for Remote using by PC software	N	Y	Y	Y	Y	Y
Standard modem communication	N	Y	Y	Y	Y	Y
Generator Power measuring by kVA, kW, kVAh, kWh, kVAr, kWrh	N	N	N	Y	Y	Y
Event logs	N	N	N	Last 50 events	Last 32 events	Last 32 events
Display	LED	LED	LED	LCD	LED	LCD
Mains contactor outputs	Y	Y	Y	Y	Y	Y
Generator contactor outputs	Y	Y	Y	Y	Y	Y
Programmable weekly working permit calendar	N	N	N	Y	Y	Y
Maintenance warning (working hour or elapsed month)	N	N	N	Y	Y	Y
Fully Programmable	Y	Y	Y	Y	Y	Y
Simple push button controlled operation	Y	Y	Y	Y	Y	Y

Automatic Transfer Switch

Manual Key Start Controller

Model	EAOM-36	EAOM-7	EAOM-71	ATS-10	EAOM-3
Automatic engine Start/Stop	Y	Y	Y	**Controls**	**Controls**
Automatic Shutdown on fault condition	Y	Y	Y	Generator remote start	Fuel and stop solenoid
Alternator voltage and frequency measurement	Frequency Measurement	Generator Voltage/ Power Measurement	Generator Voltage/ Power Measurement	Load transfer to mains	Starter motor
Load current measurement	N	3 Phase	1 Phase	Mains and generator contactor	Manual generator start/ stop
Remote Start/Stop input	Y	Y	Y	**Monitors**	Preheat (Glow Plug)
3 resistive sender units	N	N	Y	3 Phase mains voltage	**Monitors**
User configurable inputs	2	3	3	Alternator voltage	Engine running time
User configurable outputs	1	2	2	Program parameters	Error Indication
Speed sensing off Alternator	Y	Y	Y		**Fail Monitoring**
Speed sensing off magnetic Pickup	N	Y	Y		Low oil pressure
RS-232 Serial Comms	Y	Y	Y		High temperature
Remote use from PC	Y	Y	Y		Over speed failure
Standard Modem Comms	N	Y	Y		Charging fail
Display	LED	LED	LED		
Size (mm)	72 x 72	96 x 96	96 x 96	Size: 72 x 72mm	Size: 72 x 72mm

MOTOR STARTING & LIGHTING CAPACITORS

Specifications

- Dielectric material: Metalised polypropylene, low losses non inductive winding.
- Case and cover: self-extinguishing thermoplastic resin.
- Lead: 2 x 0.75mm^2. PVC 90°C.
- Reference standards: CEI 33-3; VDE 560-8; ASE 1029; VDE EN60252.
- Climatic category: 25/85/21.
- Standard tolerance: ±5%; -2+8%.
- Rated frequency: 50 – 60Hz.
- Voltage: 1.1 Un at 50Hz.
- Dissipation factor at 20°C, V = Un, 50Hz: ≤15:10-4

Lighting Capacitors – 250VAC

Supplied with 150mm flying leads and M8 mounting stud

Code	Capacitance (µF)	Size Ø x H mm
CA-2MF	2	25 x 53
CA-2.5MF	2.5	25 x 53
CA-3MF	3	25 x 53
CA-3.5MF	3.5	25 x 53
CA-4MF	4	25 x 53
CA-4.5MF	4.5	25 x 53
CA-5MF	5	25 x 69
CA-6MF	6	25 x 69
CA-6.3MF	6.3	25 x 69
CA-7MF	7	25 x 69
CA-7.5MF	7.5	30 x 73
CA-8MF	8	30 x 73
CA-9MF	9	30 x 73
CA-10MF	10	30 x 73
CA-11MF	11	30 x 73
CA-12MF	12	35 x 73

Code	Capacitance (µF)	Size Ø x H mm
CA-13MF	13	35 x 73
CA-13.5MF	13.5	35 x 73
CA-14MF	14	35 x 73
CA-15MF	15	35 x 73
CA-16MF	16	35 x 73
CA-17.5MF	17.5	35 x 73
CA-18MF	18	35 x 73
CA-20MF	20	35 x 96
CA-25MF	25	35 x 96
CA-30MF	30	40 x 95
CA-32MF	32	40 x 95
CA-35MF	35	40 x 95
CA-40MF	40	50 x 100
CA-45MF	45	50 x 100
CA-50MF	50	50 x 100
CA-55MF	55	50 x 100
CA-60MF	60	50 x 100

With mounting stud M8

Motor Run Capacitors – 480VAC

Code	Capacitance (µF)	Size Ø x H mm
CAR-1.5MF	1.5	25 x 55
CAR-2MF	2	25 x 55
CAR-3MF	3	30 x 63
CAR-4MF	4	32 x 73
CAR-5MF	5	32 x 73
CAR-6MF	6	32 x 73
CAR-8MF	8	32 x 73
CAR-10MF	10	32 x 73
CAR-12MF	12	35 x 75
CAR-14MF	14	35 x 75
CAR-16MF	16	35 x 75
CAR-18MF	18	35 x 98
CAR-20MF	20	35 x 98
CAR-25MF	25	35 x 98
CAR-30MF	30	40 x 94
CAR-40MF	40	50 x 100
CAR-50MF	50	50 x 100

Motor Start Capacitors – 275VAC

Code	Capacitance (µF)	Size Ø x H mm
CAS-30MF	30 - 36	50 x 85
CAS-50MF	53 - 64	50 x 85
CAS-100MF	88 - 106	50 x 85
CAS-125MF	124 - 149	50 x 85
CAS-130MF	130 - 156	50 x 85
CAS-160MF	145 - 174	50 x 85
CAS-300MF	270 - 324	50 x 110
CAS-328MF	328 - 454	60 x 110

WARNING: all PFC systems require protection against harmonics, generated by such devices as variable speed drives and UPS's, and transient surges including lightning.

POWER FACTOR CORRECTION CAPACITORS

Technical Characteristics

Capacitance tolerance:	-5 +10%
Frequency:	50Hz (60Hz on request)
Temperature Range:	-40°c + 55°c
Dielectric Losses:	≤ 0.5 W/kVAr
Maximum over voltage:	1.11 x Un
Maximum over current:	1.5 x In

Fuse ratings to be 1.5 to 1.8 times the nominal capacitor current

• Maximum THD in Voltage:	2%
• Maximum THD in Current:	25%
• Discharge Resistance:	Incorporated
• Dielectric:	Metalized polypropylene film
• Voltage test between terminals:	2.15 x Un 2sec
• Voltage test terminals to case:	3kV for 10 sec AC
• Standard EN60831-1/2	

Cylindrical 3 phase power factor capacitors

Ideal for use with harmonic filters
- Terminals – clamp type
- Mounting via stud
- Overpressure disconnection
- Discharge resistors fitted

Manufactured to EN60831-1/2

Rated Voltage	kVAr at 440V	kVAr at 400V	Current per Phase	Wire Size	Ø x H mm	Code
440V	1	0.8	1.3A	2.5mm²	70 x 215	C440-010
440V	1.5	1.2	1.9A	2.5mm²	70 x 215	C440-015
440V	2	1.5	2.5A	2.5mm²	70 x 215	C440-020
440V	2.5	2	3.2A	2.5mm²	70 x 215	C440-025
440V	3	2.5	3.8A	2.5mm²	70 x 215	C440-030
440V	4	3	5.0A	2.5mm²	70 x 215	C440-040
440V	5	4	6.3A	2.5mm²	70 x 215	C440-050
440V	7.5	6	9.7A	6mm²	85 x 215	C440-075
440V	10	8.5	13A	6mm²	100 x 215	C440-100
440V	12.5	10.5	17A	6mm²	100 x 215	C440-125
440V	15	13	20A	10mm²	100 x 300	C440-150
440V	20	17	26A	25mm²	120 x 300	C440-200
440V	25	22	33A	25mm²	120 x 300	C440-250
440V	30	26	39A	50mm²	136 x 300	C440-300
440V	35	29	46A	50mm²	136 x 300	C440-350
440V	40	36	58A	50mm²	136 x 300	C440-400
440V	50	45	66A	50mm²	136 x 300	C440-500

Rated Voltage	kVAr at 550V	kVAr at 400V	Current A	Wire Size	Ø x H mm	Code
550V	5	2.64	3.73A	4mm²	70 x 215	D2800
550V	7.5	3.97	5.59A	4mm²	85 x 215	C550-75
550V	10	5.29	7.46A	4mm²	85 x 215	C550-100
550V	12.5	6.61	9.32A	4mm²	100 x 215	C550-125
550V	15	7.93	11.19A	6mm²	100 x 215	C550-150
550V	20	10.58	14.91A	6mm²	100 x 300	C550-200
550V	25	13.22	18.64A	10mm²	120 x 300	C550-250
550V	30	15.87	22.37A	10mm²	120 x 300	C550-300
550V	40	21.15	29.83A	16mm²	136 x 300	C550-400
550V	50	26.44	37.28A	25mm²	136 x 300	C550-500

3 Phase Capacitors – Steel enclosed type

Ideal for use with harmonic filters
- Terminals – stud type
- Discharge resistors fitted

Manufactured to EN60831-1/2

Rated Voltage	kVAr at 440V	kVAr at 400V	Current per Phase	Wire Size	Dimensions H x A x P(mm)	Code
440V	5	4	6.5A	2.5mm²	300 x 115 x 115	R0440-050
440V	7.5	6	9.7A	4mm²	300 x 115 x 115	R0440-075
440V	10	8.5	13A	4mm²	300 x 115 x 115	R0440-100
440V	12.5	10.5	16A	6mm²	300 x 115 x 115	R0440-125
440V	15	13	20A	10mm²	300 x 115 x 115	R0440-150
440V	20	17	26A	10mm²	425 x 165 x 150	R0440-200
440V	25	22	33A	10mm²	425 x 165 x 150	R0440-250
440V	30	26	40A	16mm²	425 x 165 x 150	R0440-300
440V	35	29	46A	16mm²	425 x 165 x 150	R0440-350
440V	40	35	52A	25mm²	425 x 165 x 150	R0440-400
440V	45	38	58A	25mm²	425 x 165 x 150	R0440-450
440V	50	44	66A	50mm²	425 x 165 x 150	R0440-500
440V	60	52	79A	70mm²	425 x 320 x 150	R0440-600
440V	70	60	92A	70mm²	425 x 320 x 150	R0440-700
440V	80	70	105A	95mm²	425 x 320 x 150	R0440-800

Automatic PFC Panels – 400V

VM-100

Size	kVAr	Steps	Code
800 x 600 x 400	60	20 + 20 + 20	VM-60
800 x 600 x 400	70	20 + 20 + 30	VM-70
800 x 800 x 400	90	10 + 20 + 30 + 30	VM-90
1115 x 800 x 400	100	20 + 20 + 30 + 30	VM-100
1115 x 800 x 400	120	30 + 30 + 30 + 30	VM-120
1575 x 600 x 400	150	30 + 30 + 30 + 60	VM-150
1575 x 600 x 400	180	30 + 30 + 60 + 60	VM-180
1838 x 600 x 400	210	30 + 60 + 60 + 60	VM-210

Other standard panels available: 240, 270, 300, 330, 360, 420, 480, 540, 600 and 660kVAr.
Standard panels include incoming isolator, controller, protection fuses, contactors and capacitor banks.

kVAr Selection: See AC/DC Website. Energy audit service available

POWER FACTOR CONTROLLERS

NEW RANGE

AUTO SETUP FEATURE

AUTO SETUP FEATURE

Code	RG-8BS	RG3-12CS	ED8-96	RDM6	RDM12
Capacitor steps	8	12	8	6	12
Alarm output	✔	✔	1	1	1
Voltage measurement & supply	10-500& 230±10%	10-300& 230±10%	230/400V	380/415V	380/415V
Frequency	45/65Hz	50/60Hz	45/65Hz	50/60Hz	50/60Hz
Display type	LED	LED	LED	LCD	LCD
Size	96 x 96	144 x 144	96 x 96	96 x 96	144 x 144
External C.T.	x/5A	x/5A	x/5A	x/5A	x/5A
Programming	Auto/Man	Auto/Man	Man	Auto/Man	Auto/Man
Required COSϕ	Programmable	Programmable	Programmable	Programmable	Programmable
Displays					
RMS voltage & current	✔	✔	✔	✔	✔
COS ϕ	✔	✔	✔	✔	✔
Output relay step	LED	LED	LED	LED	LED
Alarm displays					✔
High/low voltage	High Only	High Only		✔	
High/low current	–	–		✔	✔
Under/over compensation	✔	✔		✔	✔
Over voltage/current	Voltage Only	Voltage Only	✔		
Under compensation	✔	✔	✔	✔	✔
Current & voltage distortion	✔	✔	✔	✔	✔
Alarm memory	✔	✔	–	Last 10 conditions	
Temperature	✔	✔			
Dual Target Cosϕ	✔	✔			
Energy Ratio Alarm	✔	✔			
Harmonic Measurement & Protection	✔	✔			
RS-485 Communication	✔	✔			
Compensation Individual phases, separately	–	✔ (3 CTs)			

THREE PHASE HARMONIC FILTERS

Power KVAr	Code	Power KVAr	Code
2.5	RTF-2.5	35	RTF-35
5	RTF-5	40	RTF-40
7.5	RTF-7.5	45	RTF-45
10	RTF-10	50	RTF-50
12.5	RTF-12.5	60	RTF-60
15	RTF-15	70	RTF-70
20	RTF-20	80	RTF-80
25	RTF-25	90	RTF-90
30	RTF-30	100	RTF-100

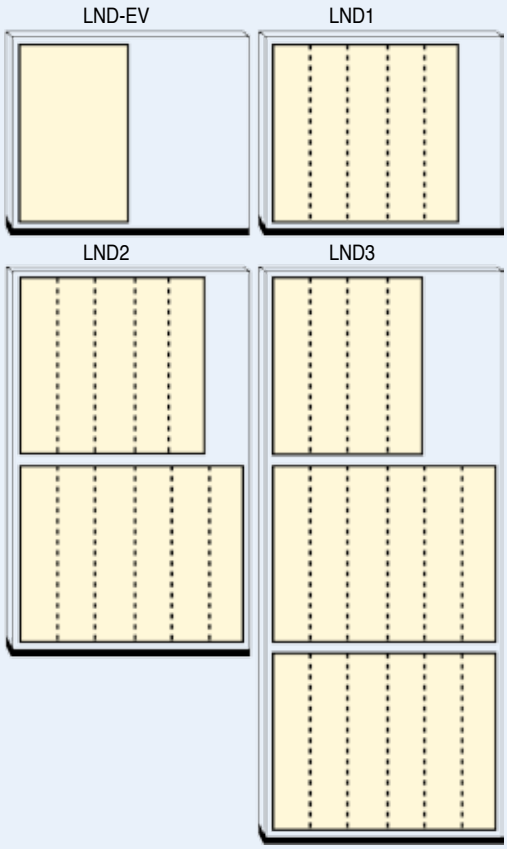
Harmonic Filters are designed to eliminate the 5th (250Hz) harmonic & higher, which can cause damage to three phase capacitors used for power factor correction.

Standards:	IEC-289; IEC-076
Tolerance "L":	3%
Thermostat Protection:	90°C
Heat Insulation Class:	Class F (155°C)
Insulation Voltage:	4kV
Maximum Overload:	1.17 x In
Maximum THD in current:	25%
Voltage:	440V, 50Hz,
Resonance Frequency:	189Hz

MODULAR POWER FACTOR CORRECTION SYSTEM

This compact modular system is both rugged and highly efficient. By ordering a base unit, the steps required plus an external CT,a complete automatic PFC system can be assembled in minutes for fast installation. The components can be stocked by PFC specialists and electrical wholesalers for immediate supply from stock. There is no need for custom engineering or workshop assembly.

- Simple ordering, assembly and installation for end users and contractors.
- A wide range of systems can be assembled from very few parts.
- Rugged 440V rated capacitors offer long life.
- Assembly is simply slide-in, plug-in and go!



Base Units IP31

Each contains incoming isolator, control fuses, controller plus terminals for external alarm and CT

Code	Max. kVAR	No. of Modules	Mounting	Size H x W x D	Max. Steps
LND-EV	25	3	Wall	380 x 425 x 360	4 Steps
LND1	62.5	5	Wall	390 x 565 x 360	6 Steps
LND2	137.5	11	Wall	720 x 565 x 360	6 Steps
LND3	200	16	Floor	1150 x 565 x 360	6 Steps

Capacitor Modules – 440V

Single Step – for LND1, 2 and 3 Base Units.
Each complete with capacitors, contactor, fuses, neon fuse indicators and plug-in connections

Code	kVAR 400V	*kVAR 440V	Modular Width
JOL-025	2.5	2.1	1
JOL-05	5	4.1	1
JOL-10	10	8.2	1
JOL-12.5	12.5	10.3	1
JOL-15	15	12.3	2
JOL-20	20	16.4	2
JOL-25	25	20.5	2

3-Step Modules for LND-EV only

One module completes the system with LND-EV

Code	kVAR 400V	*kVAR 440V	Steps	*Modular Width
JOLEV-17.5	17.5	14.4	2.5+5+10	3
JOLEV-20	20	16.4	5+5+10	3
JOLEV-25	25	20.5	5+10+10	3

*Effective value at 400V

Recommended Combinations – Many other kVAr combinations can be created to suit application requirements

Nominal kVAR 400V	Max kVAR 400V	Max kVAR 440V	Steps	Base Unit Required	Modules Required	Free Modules
20	20.5	25	5+10+10	**LND-EV**	**JOLEV-25** x 1	0
40	41	50	10+20+20	**LND1**	**JOL-10** x 1 + **JOL-20** x 2	0
50	51.25	62.5	12.5+25+25	**LND1**	**JOL-12.5** x 1 + **JOL-25** x 2	0
60	57.4	70	20+25+25	**LND2**	**JOL-20** x 1 + **JOL-25** x 2	5
75	73.8	90	15+25+25+25	**LND2**	**JOL-15** x 1 + **JOL-25** x 3	3
80	82	100	25+25+25+25	**LND2**	**JOL-25** x 4	3
100	102.5	125	25+25+25+50	**LND2**	**JOL-25** x 5	1
125	123	150	25+25+50+50	**LND3**	**JOL-25** x 6	4
150	143.5	175	25+50+50+50	**LND3**	**JOL-25** x 7	2
165	164	200	25+25+50+50+50	**LND3**	**JOL-25** x 8	0

For external CTs, see page 167. For harmonic filters, see page 188.

Specifications

- Supply & control voltage Vn, 400V
- Capacitor rated voltage, 440V
- Maximum over voltage during a 24hr period
  - For 8hrs 484V
  - For 30mins 506V
  - For 5mins 528V
  - For 1min 570V
- Maximum over current 1.3 x In
- Maximum current distortion (TDHI)
  - Peak 40%
  - Continuous 10%
- Ambient -15 to +35°C
- Operating temperature
  - Peak 55°C
  - Maximum 24hr average 45°C
  - Maximum yearly average Deg., 35°C
- Loss <0.4W/kVAr
- Life expectation is 30 000hrs x (25 ÷ D)
- Standards: IEC 60439-1, IEC 60831-1

Autonics

PID TEMPERATURE CONTROLLERS

EXTENDED RANGE

Universal 4 digit temperature controller – Dual indication (full PID controller)

Size (H x W)	48 x 48	48 x 48	72 x 72 / 96 x 96		96 x 48	48 x 96
Control Relay & Alarm Relay	**TZN4S-14R**	**TZ4ST-14R**	**TZN4M-14R**	**TZ4L-14R**	**TZ4H-14R**	**TZ4W-14R**
4-20mA output & Alarm Relay	**TZN4S-14C**	**TZ4ST-14C**	**TZN4M-14C**	**TZ4L-14C**	**TZ4H-14C**	**TZ4W-14C**
Control Relay + 2 Alarm Relays	**TZN4S-24R**	**TZN4S-24R**	**TZN4M-24R**	**–**	**–**	**TZ4W-24R**

Features

- 2 x 7 digit LED displays:
  PV (Process Value) RED
  SV_1 (Set Point Value) GREEN
- Measure range: multi-range and pre-scalable
- Input types: TC (J, K, R, S, T,...)
  RTD (PT100...)
  0-10V, 1-5V, 4-20mA
- SV_2 input for oven door interlock
- Indicating accuracy of ±0.3% (F - S)
- Dual PID function selectable fast response PID action (PIDF) or slow response PID action (PIDS)
- Control: ON/OFF, P, PI, PD, PIDF, PIDS control

Specification

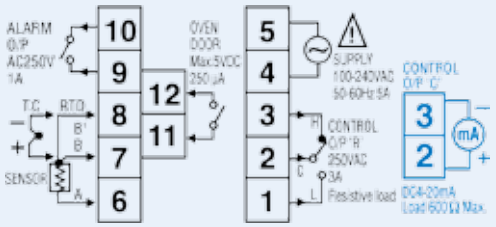
Multi-volt Supply: 100 to 240VAC

Consumption: 5VA

Control Relay output: C/O 3A @ 250VAC

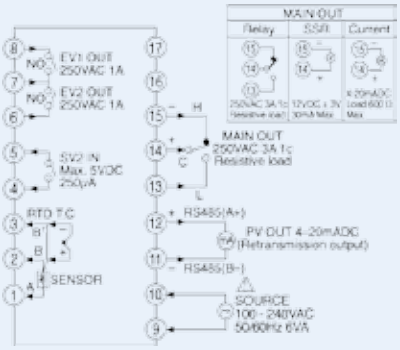
Sampling time: 250ms

Connection Diagram for TZN4S



Connection Diagram for TZN4M

Connection Diagram for TZ4H



TEMPERATURE INDICATORS

Type	Indicator	Indicator	5 Sensor Input Indicator	Indicator	Indicator	
Size	24 x 48mm	36 x 72mm	48 x 96mm	34 x 76mm	72 x 72mm	96 X 96mm
Supply Volts	12-24VDC	100-240VAC	110-240VAC	230VAC	110-230VAC	
Code: PT100	**T3NI-400P**	**T4YI-400P**	**T4WM-400P**	**MTR10-599P**	**SG-781*P**	**SG-681*P**
Code: J	**–**	**T4YI-500J**	**T4WM-500J**	**MTR10-999J**	**SG-781*J**	**SG-681*J**
Code: K	**–**	**T4YI-1200K**	**T4WM-1200K**	**MTR10-999K**	**SG-781*K**	**SG-681*K**
Temperature Range	–	–	–	–	*Add temp range **100**, **200**, **400**°C	

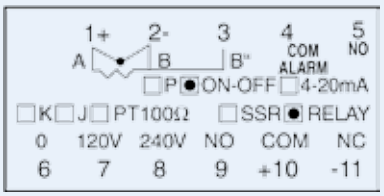
TEMPERATURE CONTROLLERS

	Analog Setting	Analog Setting & Deviation Display	Analog Setting & Full Scale Display		Thumbwheel Setting & Digital Display	
ON/OFF Control						
Size 96 x 48	–	–	–	–	–	**SG-861***
Size 72 x 72	**SG-714***	**SG-724***	–	**SG-742***	**SG-771***	–
Size 96 x 96	**SG-612***	**SG-622***	**SG-632***	–	**SG-671***	–
With alarm 72 x 72/96 x 96	–	–	–	–	**SG-771/A*/SG-671/A***	**SG-861/A***
Range & Probe	*Add temperature **100**, **200**, **400** or **600**°C and Probe type PT100., J or K e.g. **SG-622 400J**					
Higher Range 'K'	–	–	**800** & **1200**°C		–	–

Technical specification

Supply:	110/220VAC	Control:	On/Off action
Input:	Thermocouple	Output:	Relay 1C/O
	K, J and PT100		5A@250V
Accuracy:	1% of full scale	Hysteresis:	2,5% full scale
		Alarm:	10% of full scale

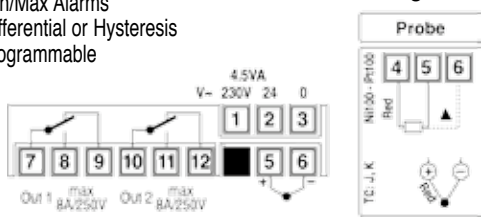
Connection diagram



	Digital 1 Set Point	Digital 2 Set Point	Thumbwheel 1 Set Point	Analog 1 Set Point	Digital
ON/OFF Control					
Size	72 x 72mm	72 x 72mm	48 x 48mm	48 x 48mm	34 x 76mm
Probe PT100	**VM6251** -99° to 999°C	**VM6269** -99° to 999°C	**TP-48*P** *100, 200, 400°C	**TR-48*P** *100, 200, 400°C	**MTR11-150PTC***
Probe J & K	**VM6392** -99° to 999°C	**VM6400** -99° to 999°C	**TP-48*J** *200, 400°C	**TR-48*J** *100, 200, 400°C	–
			TP-48*K *200, 400°C	**TR-48*K** *100, 200, 400°C	–

Technical specification
Supply: 24 or 230VAC
Input: Thermocouple K, J & PT100
Accuracy: 1% of full scale
Output: Relay C/O 8A@250V
• Min/Max Alarms
• Differential or Hysteresis programmable
• Direct/Reverse PWM & Neutral zone operation

Connection diagram



When using 2-wire PT100 Probe, short circuit terminals 4 and 5

Transparent cover for 72 x 72 **VJ4482**

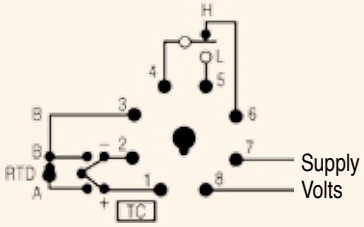
IP54

Adaptor for 72 x 72 to 96 x 96 **VJ4458**

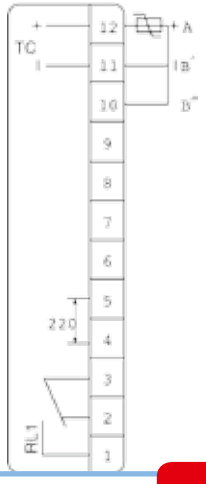
All supplied complete with Y-50 mounting bracket
Specifications:
Supply voltage 110-240VAC
Hysteresis 2,5% full scale
Relay output: 1 C/O @ 2A 250VAC
Panel-mount or 8 pin plug-in.

Reversed 8 pin **P3G-08**

Connection diagram



• Supply: 230VAC
* C/W Probe
Range: 50-150°C
Spare Probe: **PTC150**

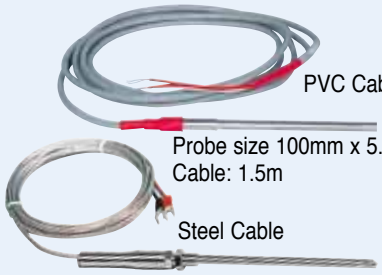


For blind temperature controllers, see page 67.

TEMPERATURE PROBES

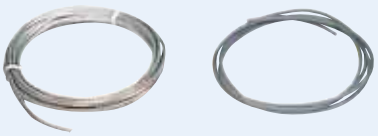
Thermocouples

NOTE: Wire Colours
J: White & White with Yellow Stripe
K: White & White with Red Stripe
PT100: 2 x White, 1 x Red



Probe size 100mm x 5.0 Ø
Cable: 1.5m

Thread size 1/4" or 1/2"
Cable: 1.5m



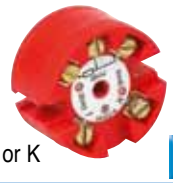
Steel Braided Cable PVC Coated

Probe:
1/2" Thread
150mm x 5.0 Ø

Probe Type	Thermo-couple Type	Temp Range	Cable Type	Screw Type Code	Temp Range	Code	Description	Head Type Code	Large Head Code	Com-pression Clamp
PT100	**TC-P 100D** Std 1/4" thread	100°C	PVC	**TC-P/S***	400°C	**TC-P2 CABLE**	200°C PVC coated Grey	**KSE-P**	**KEN-P**	1/2" Brass **CC-02B**
						TC-P4 CABLE	400°C Steel braided			
PT100	**TC-P 200D***	200°C	PVC							1/4" Brass **CC-04B**
PT100	**TC-P STEEL** Std ¼" thread	400°C	Steel							1/2" S/Steel **CC-02S**
Type J	**TC-J***	400°C	Steel	**TC-J/S***	400°C	**TC-J CABLE**	400°C Steel braided	**KSE-J**	**KEN-J**	
Type K	**TC-K***	400°C	Steel	**TC-K/S***	400°C	**TC-K CABLE**	400°C Steel braided	**KSE-K**	**KEN-K**	1/4" S/Steel **CC-04S**
*Specify **1/4"** or **1/2"**				*Specify **1/4"** or **1/2"**						

RHOMBERG

Installation example



Fits into Head Type KEN-P, J or K

Temperature Transmitter (2 wire)

Code	Specification	
TRT-PT100*	Output Signal:	4 - 20mA DC
TRT-J*	Power Supply:	12 - 40VDC
TRT-K*	Accuracy:	±0.15% F.S. (PT100)
		±0.5% F.S. (J & K)

*Add Temperature range PT100: **50, 100,150, 200, 400°C**
J: **100,150, 200, 400, 600°C**
K: **100,150, 200, 400, 600, 1000, 1200°C**

RHE

Thermocouple Connectors

Female	Male
FPL-PT100	**MPL-PT100**
FPL-J	**MPL-J**
FPL-K	**MPL-K**

SCR HEATER ELEMENT REGULATORS

Benefits

- Small size, saving space
- High accuracy and fast response
- Eliminates contactor noise
- Extends heater life
- High efficiency, no maintenance
- Maintains stable process temperature

Voltage Control for Heaters Single Phase (230V)

Code	Current	KW	Ultra fast Fuse	Code	Current	KW	Ultra fast Fuse
SG-027	27A	6	30A	**SG-100**	100A	22	100A
SG-057	57A	12.5	60A	**SG-132**	132A	29.3	160A
				SG-162	162A	36	160A

Three Phase (400V)

Code	Load Current	KW	Ultra fast Fuse	Code	Load Current	KW	Ultra fast Fuse
SG-325	25A	16.5	25A	**SG-3100**	100A	66	100A
SG-350	50A	33	50A	**SG-3130**	130A	86	160A
SG-375	75A	49	75A	**SG-3160**	160A	105	160A

Specifications

Input Signal: 4-20mA, 0-20mA, 1-5VDC. 0-5VDC
Control System: Phase control
Insulation Resistance: 500VDC (10g ohms)

Output Voltage: 0-100%
Constant- Voltage Characteristics: Output accuracy 1%
Ambient Temperature: -10/50°C Humidity 90% RH below
VR1: Min V output Ads.
VR2: Max V output Ads.

Connection Diagram